

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 3 and 4 have been amended as follows:

Listing of Claims:

Claim 1 (original): A method of measuring an intrinsic resistance of a battery comprising the steps of:

measuring periodically a discharge current and a terminal voltage responding to the discharge current at a low rate discharge of the battery;

determining a first approximate expression of the terminal voltage with respect to the increasing discharge current and a second approximate expression of the terminal voltage with respect to the decreasing discharge current based on the measured discharge current and terminal voltage;

defining a range of the intrinsic resistance based on the first and second approximate expressions;

assuming a resistance in the range of the intrinsic resistance as a tentative intrinsic resistance;

determining a tentative maximum polarization time from the second approximate expression and the tentative intrinsic resistance; and

determining the intrinsic resistance from two relational expressions including the intrinsic resistance, an intrinsic maximum polarization time and the tentative maximum polarization time.

Claim 2 (original): The method as claimed in claim 1, wherein said two relational expressions comprise:

a first relational expression given by equating the intrinsic resistance to a formula of $\{(a \text{ period of time between a start of discharge and the intrinsic maximum polarization time})/(a \text{ period of time between the start of discharge and the tentative maximum polarization time})\} \times (a \text{ maximum value in the range of the intrinsic resistance}) + \{(a \text{ period of time between the intrinsic maximum polarization time and the tentative maximum polarization time})/(the period of time between the start of discharge and the tentative maximum polarization time)} \times (a \text{ minimum value in the range of the intrinsic resistance})$; and

a second relational expression given by equating the intrinsic resistance to a formula of a differential equation of the second approximate expression substituted the discharge current with a current of a formula of $(a \text{ peak current}) \times \{(the \text{ period of time between the intrinsic and tentative maximum polarization times})/(a \text{ period of time between a peak current time and the tentative maximum polarization time})\}$.

Claim 3 (currently amended): The method as claimed in claim [[1 or]] 2, further comprising the steps of:

differentiating the first approximate expression with respect to the discharge current to obtain a first amount of change;

differentiating the second approximate expression with respect to the discharge current to

obtain a second amount of change; and

defining the range of the intrinsic resistance between (the first amount of change + the second amount of change)/2 and (the second amount of change) at the peak current.

Claim 4 (currently amended): The method as claimed in ~~any one of claims 1-3~~ claim 1, wherein the center value of the range of the intrinsic resistance is the tentative intrinsic resistance.

Claim 5 (original): An apparatus for measuring an intrinsic resistance of a battery comprising:

a current sensor for measuring a discharge current of a battery at a low rate discharge;
a voltage sensor for measuring a terminal voltage of the battery responding to the discharge current;

an interface circuit for converting the measured voltage from analog to digital; and
a microcomputer having a CPU, a RAM and a ROM,
wherein the CPU
receives data of the measured current and voltage from the interface circuit;
calculates a first approximate expression of the terminal voltage with respect to the increasing discharge current and a second approximate expression of the terminal voltage with respect to the decreasing discharge current from the measured discharge current and terminal voltage;
defines a range of the intrinsic resistance from the first and second approximate expressions;
assumes a resistance in the range of the intrinsic resistance as a tentative intrinsic resistance;

determines a tentative maximum polarization time from the second expression and the tentative intrinsic resistance; and

determines the intrinsic resistance from two relational expressions including the intrinsic resistance, an intrinsic maximum polarization time and the tentative maximum polarization time.